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(4) Purification, compression, or processing of CO₂.

(5) On-site use of CO₂ captured on site.

(c) This source category does not include CO₂ imported or exported in equipment, such as fire extinguishers.

§ 98.421 Reporting threshold.

Any supplier of CO₂ who meets the requirements of § 98.2(a)(4) of subpart A of this part must report the mass of CO₂ captured, extracted, imported, or exported.

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(a) Mass of CO₂ captured from production process units.

(b) Mass of CO₂ extracted from CO₂ production wells.

(c) Mass of CO₂ imported.

(d) Mass of CO₂ exported.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 79169, Dec. 17, 2010]

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§ 98.423 Calculating CO₂ supply.

(a) Except as allowed in paragraph (b) of this section, calculate the annual mass of CO₂ captured, extracted, imported, or exported through each flow meter in accordance with the procedures specified in either paragraph (a)(1) or (a)(2) of this section. If multiple flow meters are used, you shall calculate the annual mass of CO₂ for all flow meters according to the procedures specified in paragraph (a)(3) of this section.

(1) For each mass flow meter, you shall calculate quarterly the mass of CO₂ in a CO₂ stream in metric tons by multiplying the mass flow by the composition data, according to Equation PP-1 of this section. Mass flow and composition data measurements shall be made in accordance with § 98.424 of this subpart.

$$CO_{2,u} = \sum_{p=1}^4 Q_{p,u} * C_{CO_{2,p,u}} \quad (\text{Eq. PP-1})$$

Where:

CO_{2,u} = Annual mass of CO₂ (metric tons) through flow meter u.

C_{CO₂,p,u} = Quarterly CO₂ concentration measurement in flow for flow meter u in quarter p (wt. %CO₂).

Q_{p,u} = Quarterly mass flow rate measurement for flow meter u in quarter p (metric tons).

p = Quarter of the year.

u = Flow meter.

(2) For each volumetric flow meter, you shall calculate quarterly the mass of CO₂ in a CO₂ stream in metric tons by multiplying the volumetric flow by the concentration and density data, according to Equation PP-2 of this section. Volumetric flow, concentration and density data measurements shall be made in accordance with § 98.424 of this section.

$$CO_{2,u} = \sum_{p=1}^4 Q_p * D_p * C_{CO_{2,p}} \quad (\text{Eq. PP-2})$$

Where:

CO_{2,u} = Annual mass of CO₂ (metric tons) through flow meter u.

C_{CO₂,p} = Quarterly CO₂ concentration measurement in flow for flow meter u in quarter p (measured as either volume % CO₂ or weight % CO₂).

Q_p = Quarterly volumetric flow rate measurement for flow meter u in quarter p (standard cubic meters).

D_p = Density of CO₂ in quarter p (metric tons CO₂ per standard cubic meter) for flow meter u if C_{CO₂,p} is measured as volume % CO₂, or density of the whole CO₂ stream for flow meter u (metric tons per standard

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cubic meter) if $C_{CO_2,p}$ is measured as weight % CO_2 .

p = Quarter of the year.
u = Flow meter.

(3) To aggregate data, use either Equation PP-3a or PP-3b in this paragraph, as appropriate.

$$CO_2 = \sum_{p=1}^U CO_{2,u} \quad (\text{Eq. PP-3a})$$

where:

CO_2 = Total annual mass of CO_2 (metric tons).
 $CO_{2,u}$ = Annual mass of CO_2 (metric tons) through flow meter u.
u = Flow meter.

$$CO_2 = \sum_{p=1}^U CO_{2,u} - \sum_{p=1}^V CO_{2,v} \quad (\text{Eq. PP-3b})$$

where:

CO_2 = Total annual mass of CO_2 (metric tons).
 $CO_{2,u}$ = Annual mass of CO_2 (metric tons) through main flow meter u.
 $CO_{2,v}$ = Annual mass of CO_2 (metric tons) through subsequent flow meter v for use on site.
u = Main flow meter.
v = Subsequent flow meter.

(b) As an alternative to paragraphs (a)(1) through (3) of this section for CO_2 that is supplied in containers, calculate the annual mass of CO_2 supplied in containers delivered by each CO_2 stream in accordance with the procedures specified in either paragraph (b)(1) or (b)(2) of this section. If multiple CO_2 streams are used to deliver CO_2 to containers, you shall calculate the annual mass of CO_2 supplied in containers delivered by all CO_2 streams according to the procedures specified in paragraph (b)(3) of this section.

(1) For each CO_2 stream that delivers CO_2 to containers, for which mass is measured, you shall calculate CO_2 supply in containers using Equation PP-1 of this section.

where:

(i) For facilities with production process units that capture a CO_2 stream and either measure it after segregation or do not segregate the flow, calculate the total CO_2 supplied in accordance with Equation PP-3a.

(ii) For facilities with production process units that capture a CO_2 stream and measure it ahead of segregation, calculate the total CO_2 supplied in accordance with Equation PP-3b.

$CO_{2,u}$ = Annual mass of CO_2 (metric tons) supplied in containers delivered by CO_2 stream u.
 $C_{CO_2,p,u}$ = Quarterly CO_2 concentration measurement of CO_2 stream u that delivers CO_2 to containers in quarter p (wt. % CO_2).
 $Q_{p,u}$ = Quarterly mass of contents supplied in all containers delivered by CO_2 stream u in quarter p (metric tons).
p = Quarter of the year.
u = CO_2 stream that delivers to containers.

(2) For each CO_2 stream that delivers to containers, for which volume is measured, you shall calculate CO_2 supply in containers using Equation PP-2 of this section.

where:

$CO_{2,u}$ = Annual mass of CO_2 (metric tons) supplied in containers delivered by CO_2 stream u.
 $C_{CO_2,p}$ = Quarterly CO_2 concentration measurement of CO_2 stream u that delivers CO_2 to containers in quarter p (measured as either volume % CO_2 or weight % CO_2).
 Q_p = Quarterly volume of contents supplied in all containers delivered by CO_2 stream u in quarter p (standard cubic meters).
 D_p = Quarterly CO_2 density determination for CO_2 stream u in quarter p (metric tons per standard cubic meter) if $CO_{2,p}$ is

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measured as volume % CO₂, or density of CO₂ stream u (metric tons per standard cubic meter) if CO_{2,p} is measured as weight % CO₂.

p = Quarter of the year.

u = CO₂ stream that delivers to containers.

(3) To aggregate data, sum the mass of CO₂ supplied in containers delivered by all CO₂ streams in accordance with Equation PP-3a of this section. where:

CO₂ = Annual mass of CO₂ (metric tons) supplied in containers delivered by all CO₂ streams.

CO_{2,u} = Annual mass of CO₂ (metric tons) supplied in containers delivered by CO₂ stream u.

u = CO₂ stream that delivers to containers.

(c) Importers or exporters that import or export CO₂ in containers shall calculate the total mass of CO₂ imported or exported in metric tons based on summing the mass in each CO₂ container using weigh bills, scales, or load cells according to Equation PP-4 of this section.

$$CO_2 = \sum_{p=1}^I Q \quad (\text{Eq. PP-4})$$

where:

CO₂ = Annual mass of CO₂ (metric tons).

Q = Annual mass in all CO₂ containers imported or exported during the reporting year (metric tons).

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 79169, Dec. 17, 2010]

§ 98.424 Monitoring and QA/QC requirements.

(a) Determination of quantity.

(1) Reporters following the procedures in § 98.423(a) shall determine quantity using a flow meter or meters located in accordance with this paragraph.

(i) If the CO₂ stream is segregated such that only a portion is captured for commercial application or for injection, you must locate the flow meter according to the following:

(A) For reporters following the procedures in § 98.423(a)(3)(i), you must locate the flow meter(s) after the point of segregation.

(B) For reporters following the procedures in paragraph (a)(3)(ii) of § 98.423, you must locate the main flow meter(s) on the captured CO₂ stream(s) prior to the point of segregation and the subsequent flow meter(s) on the CO₂ stream(s) for on-site use after the point of segregation. You may only follow the procedures in paragraph (a)(3)(ii) of § 98.423 if the CO₂ stream(s) for on-site use is/are the only diversion(s) from

the main, captured CO₂ stream(s) after the main flow meter location(s).

(ii) Reporters that have a mass flow meter or volumetric flow meter installed to measure the flow of a CO₂ stream that meets the requirements of paragraph (a)(1)(i) of this section shall base calculations in § 98.423 of this subpart on the installed mass flow or volumetric flow meters.

(iii) Reporters that do not have a mass flow meter or volumetric flow meter installed to measure the flow of the CO₂ stream that meets the requirements of paragraph (a)(1)(i) of this section shall base calculations in § 98.423 of this subpart on the flow of gas transferred off site using a mass flow meter or a volumetric flow meter located at the point of off-site transfer.

(2) Reporters following the procedures in paragraph (b) of § 98.423 shall determine quantity in accordance with this paragraph.

(i) Reporters that supply CO₂ in containers using weigh bills, scales, or load cells shall measure the mass of contents of each CO₂ container to which the CO₂ stream is delivered, sum the mass of contents supplied in all containers to which the CO₂ stream is delivered during each quarter, sample the CO₂ stream delivering CO₂ to containers on a quarterly basis to determine the composition of the CO₂ stream, and apply Equation PP-1.